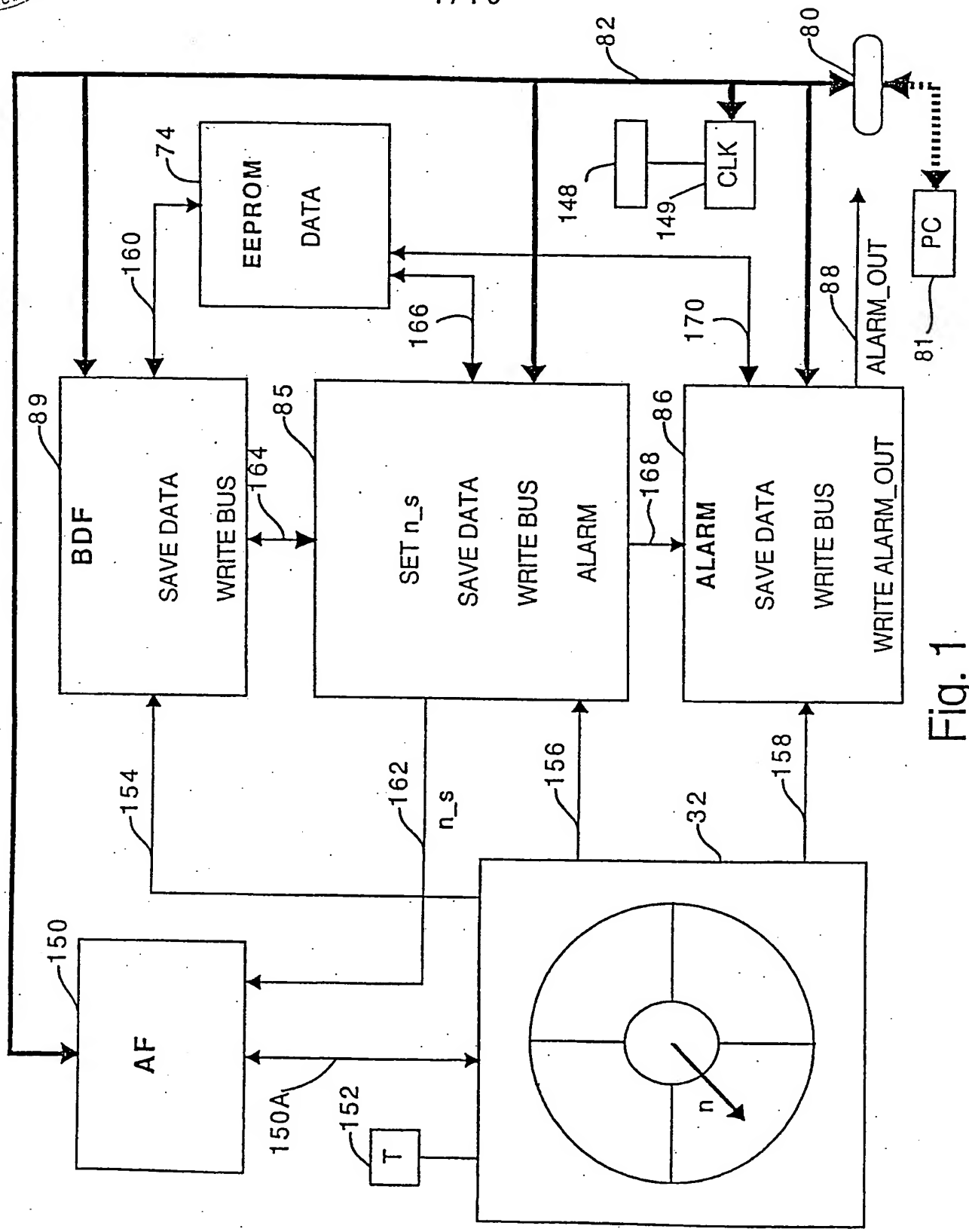

Fig. 1

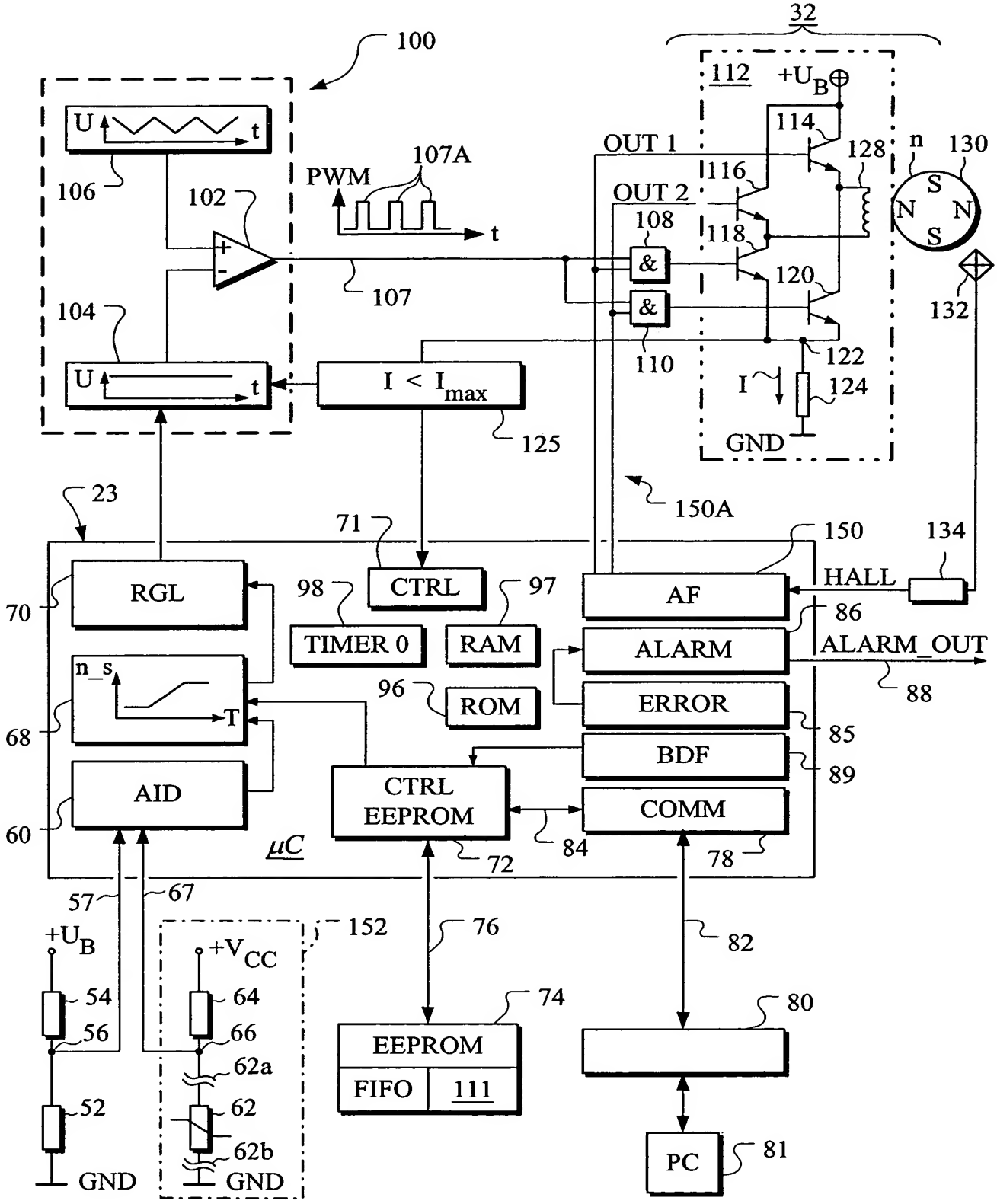
32
100
112
+U_B
114
OUT 1
128
n
130
PWM
107A
116
OUT 2
S
N
N
S
106
102
108
118
t
107
120
132
104
&
&
110
122
U
t
I < I_max
I
124
125
GND
23
150A
71
150
134
RGL
98
CTRL
97
AF
HALL
70
TIMER 0
RAM
86
ALARM
ALARM_OUT
n_s
96
ROM
88
ERROR
68
T
85
BDF
89
AID
CTRL
EEPROM
COMM
60
μC
72
84
78
57
67
152
76
82
+U_B
+V_CC
74
80
54
64
EEPROM
56
66
FIFO
111
62a
52
62
62b
PC
81
GND
GND

Fig. 2

Fig. 3

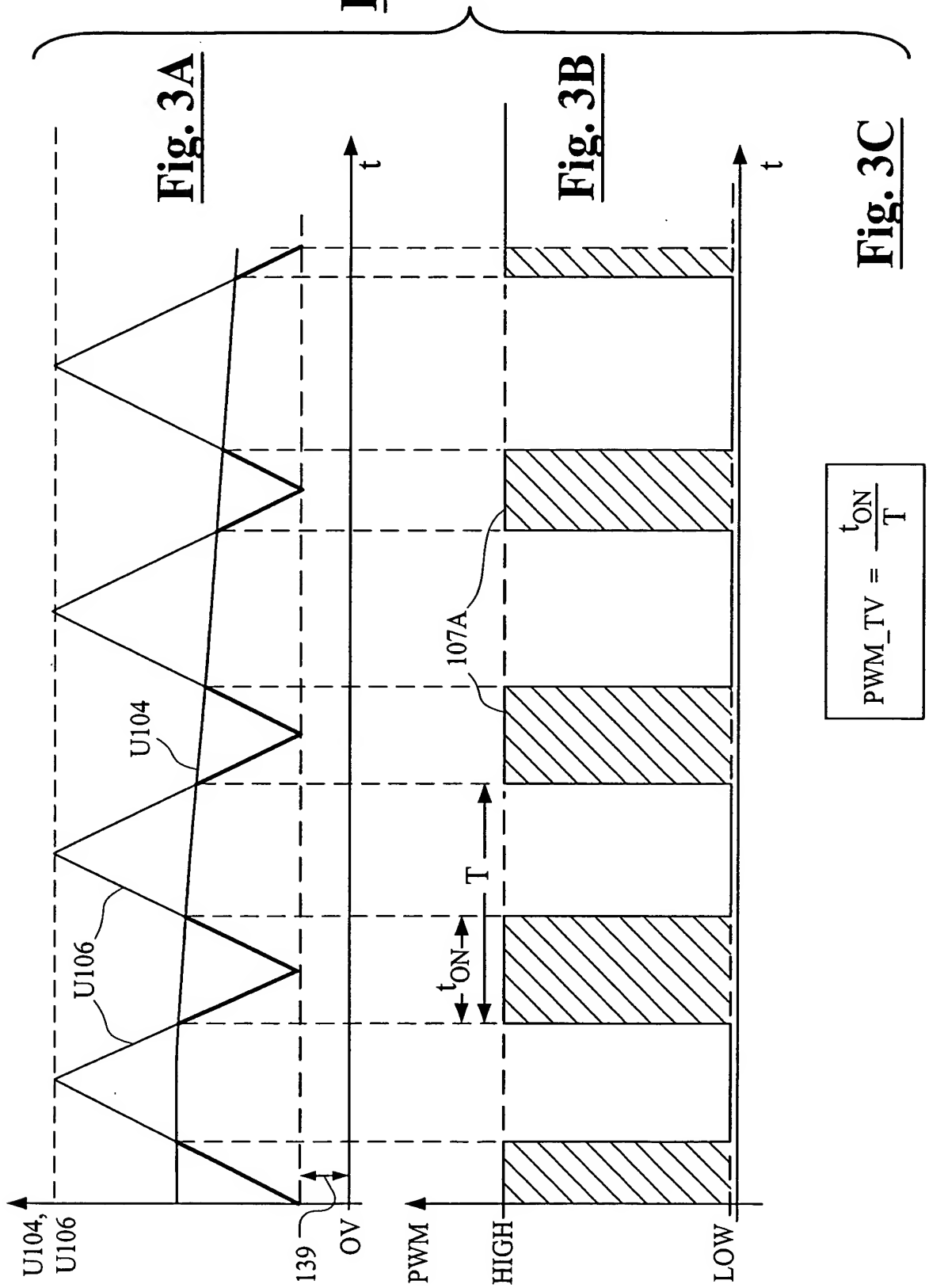
Fig. 3A
Fig. 3B
Fig. 3C
t
t
U104
U106
107A
T
t_{ON}
U104, U106
139
0V
PWM
HIGH
LOW
$PWM\_TV = \frac{t_{ON}}{T}$

611 = HALL_INTERRUPT

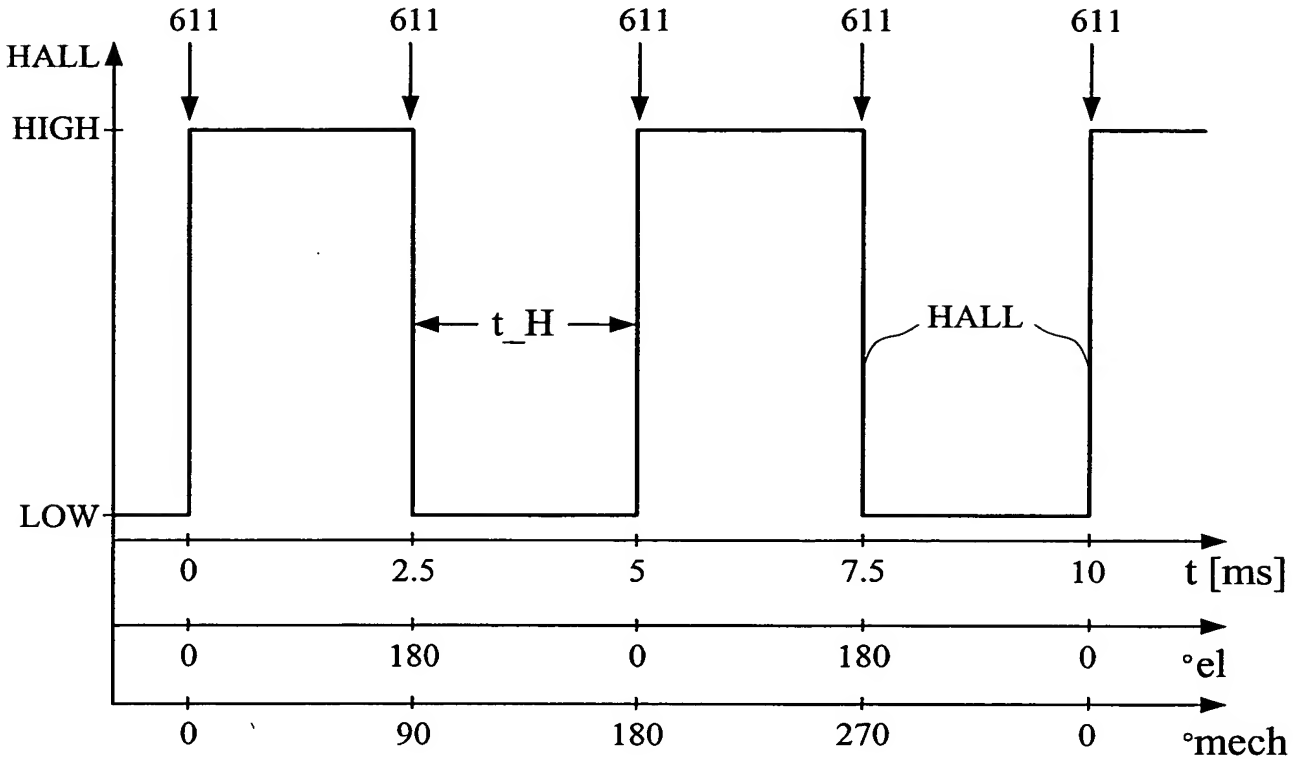

Fig. 4

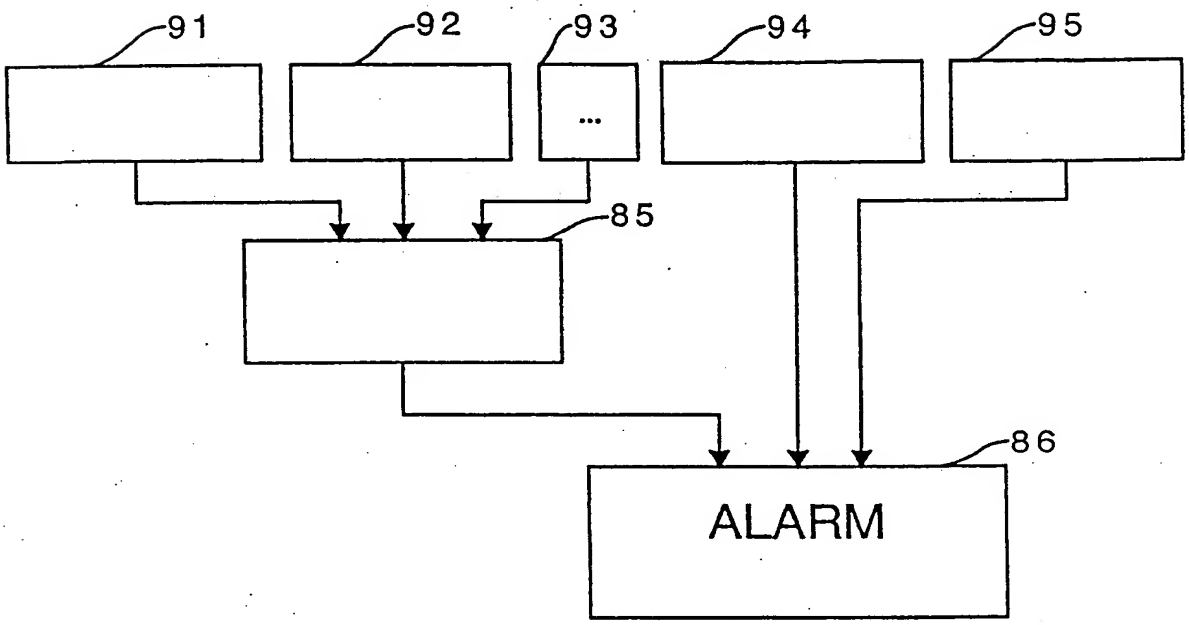

Fig. 5

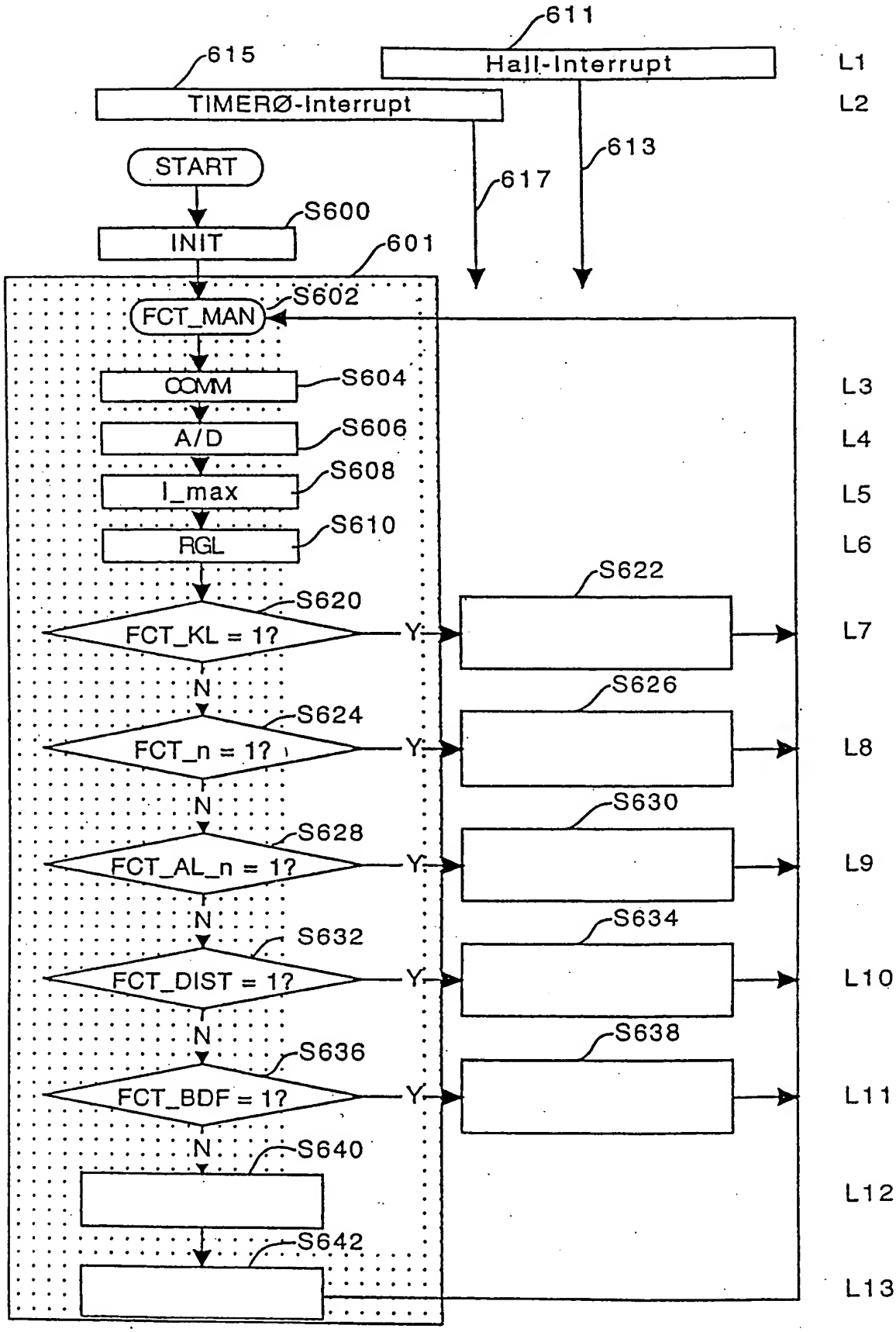
611
Hall-Interrupt
L1
615
TIMERØ-Interrupt
L2
613
617
START
S600
INIT
601
S602
FCT_MAN
S604
COMM
L3
S606
A/D
L4
S608
I_max
L5
S610
RGL
L6
S622
S620
FCT_KL = 1?
Y
L7
N
S626
S624
FCT_n = 1?
Y
L8
N
S630
S628
FCT_AL_n = 1?
Y
L9
N
S634
S632
FCT_DIST = 1?
Y
L10
N
S638
S636
FCT_BDF = 1?
Y
L11
N
S640
L12
S642
L13

Fig. 6

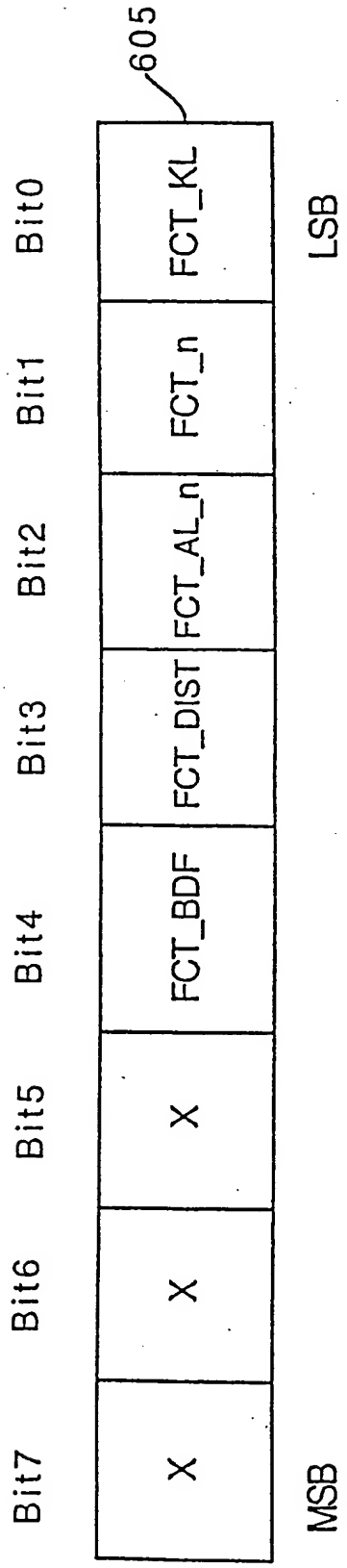
605
Bit0
Bit1
Bit2
Bit3
Bit4
Bit5
Bit6
Bit7
FCT_KL
FCT_n
FCT_AL_n
FCT_DIST
FCT_BDF
X
X
X
LSB
MSB

Fig. 7

Objecttable

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Index	Memorytype	Access	Name
0x20	unsigned8	R/W	DIST_CTRL
0x21	unsigned8	R/W	DIST_STATE
0x22	unsigned16	R/W	DIST_CODE
0x23	unsigned8	R/W	DIST_REAC
0x24	unsigned8	R/W	n_DIST
0x25	unsigned8	R/W	t_COMM_TO
0x30	unsigned8	R/W	OD_TMAX
0x31	unsigned8	R/W	OD_UBMAX
0x32	unsigned24	R/W	OD_OHO
0x33	unsigned24	R/W	OD_COMMUT

Fig. 8

DI_CTRL

Bit	Name	LOW	HIGH
0	DC_LATCH	NO_LATCH	LATCH
1-6	RES		
7	DC_CLEAR	0 -> 1 -> 0 to clear	

Fig. 9

DI_STATE

Bit	Name	VAL	Meaning
0-2	DS_CLASS	0	DS_μC
		1	DS_COMM
		2	DS_SENS
		3	DS_HW
		4-7	RES
3-6	RES		
7	DS_ACTIVE	0	NO_DIST
		1	DIST

Fig. 10

DI_CODE (16 Bit)

Class	VAL	Name
DS_µC	0-999	
	0	DN_WDT
	1	DN_CHKS_ROM
	2	DN_CHKS_RAM
	3	DN_CHKS_EEPROM
	4	DN_TEST_RAM
	5-999	RES
DS_COMM	1000-1999	
	1000	DN_TIMEOUT_TRANSFER
	1001	DN_TIMEOUT_BUS
	1002	DN_PROT_ERR
	1003	DN_INVAL_DATA
	1004-1999	RES
DS_SENSOR	2000-2999	
	2000	DN_SENSOR_INTERRUPT
	2001	DN_SENSOR_SHORT
	2002-2999	RES
DS_HW	3000-3999	
	3000	DN_DRIVER_FAULT
	3001-3999	RES
RES	4000-65535	

Fig. 11

DI_REAC

Bit	Name	VAL	Meaning
0-2	DR_REAC	0	DR_OFF
		1	DR_n_max
		2	DR_n_min
		3	DR_n_0
		4	DR_n_DIST
		5	DR_BRAKE
		6-7	RES
3	DR_AL	0	DR_AL_OFF
		1	DR_AL_ON
4-7	RES		

Fig. 12

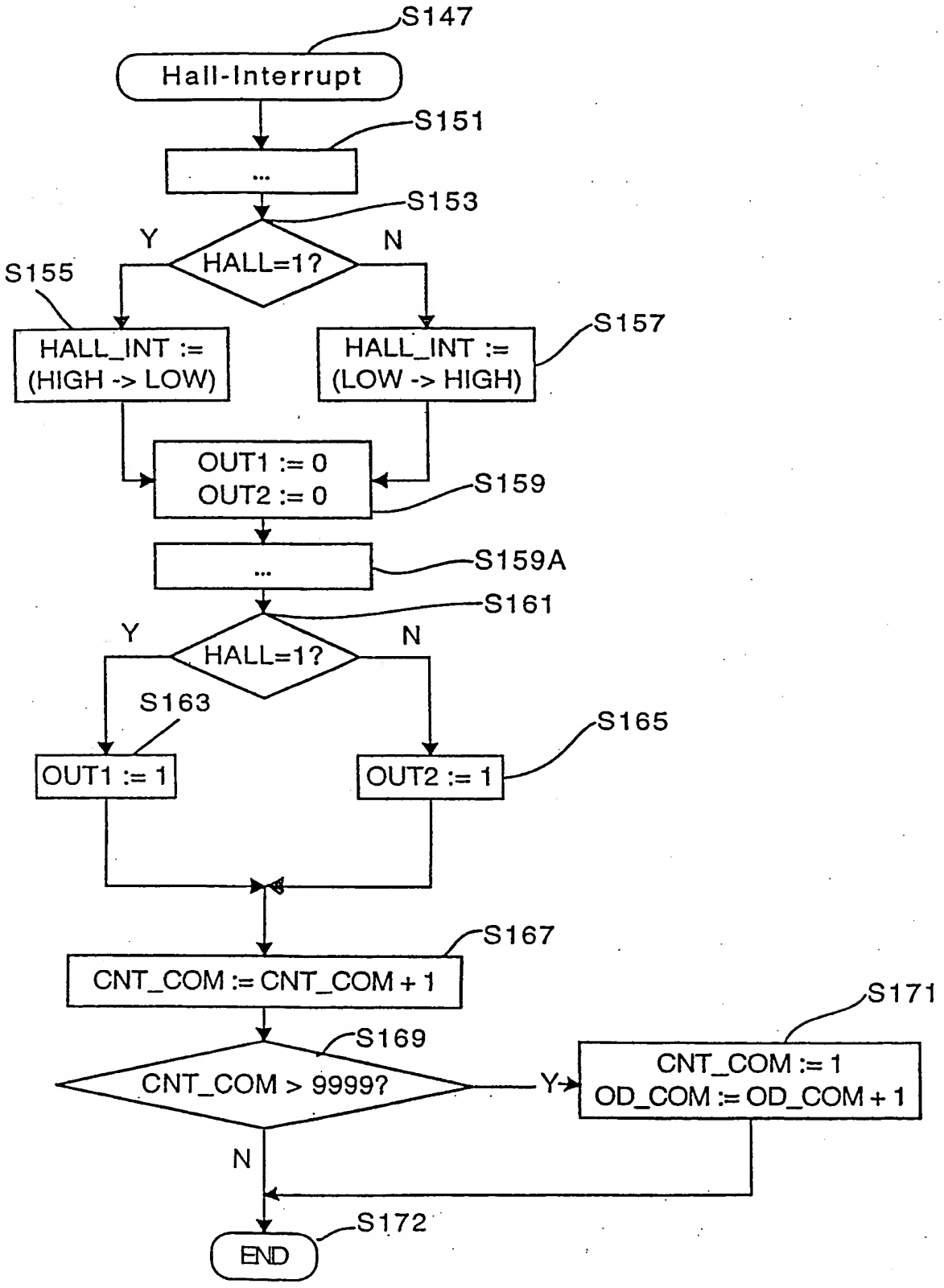
S147
Hall-Interrupt
S151
...
S153
HALL=1?
Y
N
S155
HALL_INT :=
(HIGH -> LOW)
S157
HALL_INT :=
(LOW -> HIGH)
OUT1 := 0
OUT2 := 0
S159
...
S159A
S161
HALL=1?
Y
N
S163
OUT1 := 1
S165
OUT2 := 1
S167
CNT_COM := CNT_COM + 1
S169
CNT_COM > 9999?
Y
S171
CNT_COM := 1
OD_COM := OD_COM + 1
N
S172
END

Fig. 13

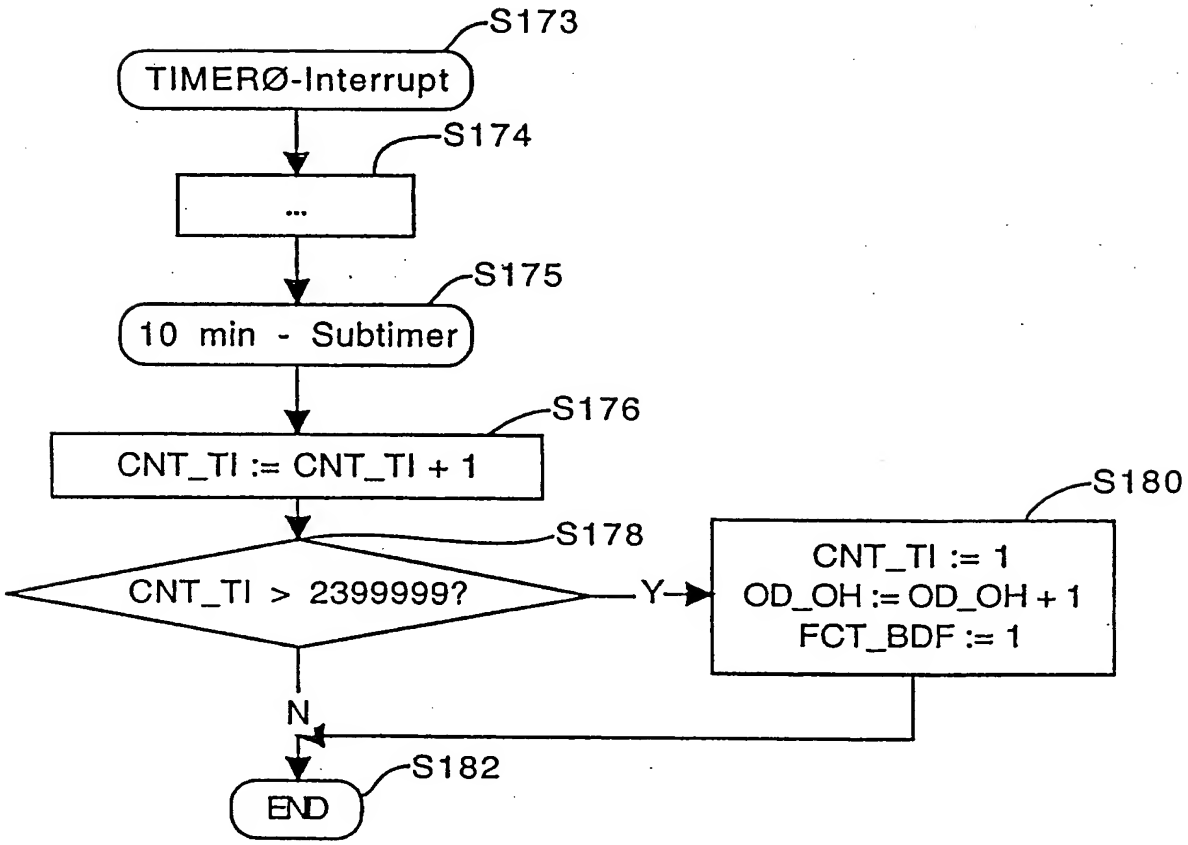
S173
TIMERØ-Interrupt
S174
...
S175
10 min - Subtimer
S176
CNT_TI := CNT_TI + 1
S178
CNT_TI > 2399999?
Y
S180
CNT_TI := 1
OD_OH := OD_OH + 1
FCT_BDF := 1
N
S182
END

Fig. 14

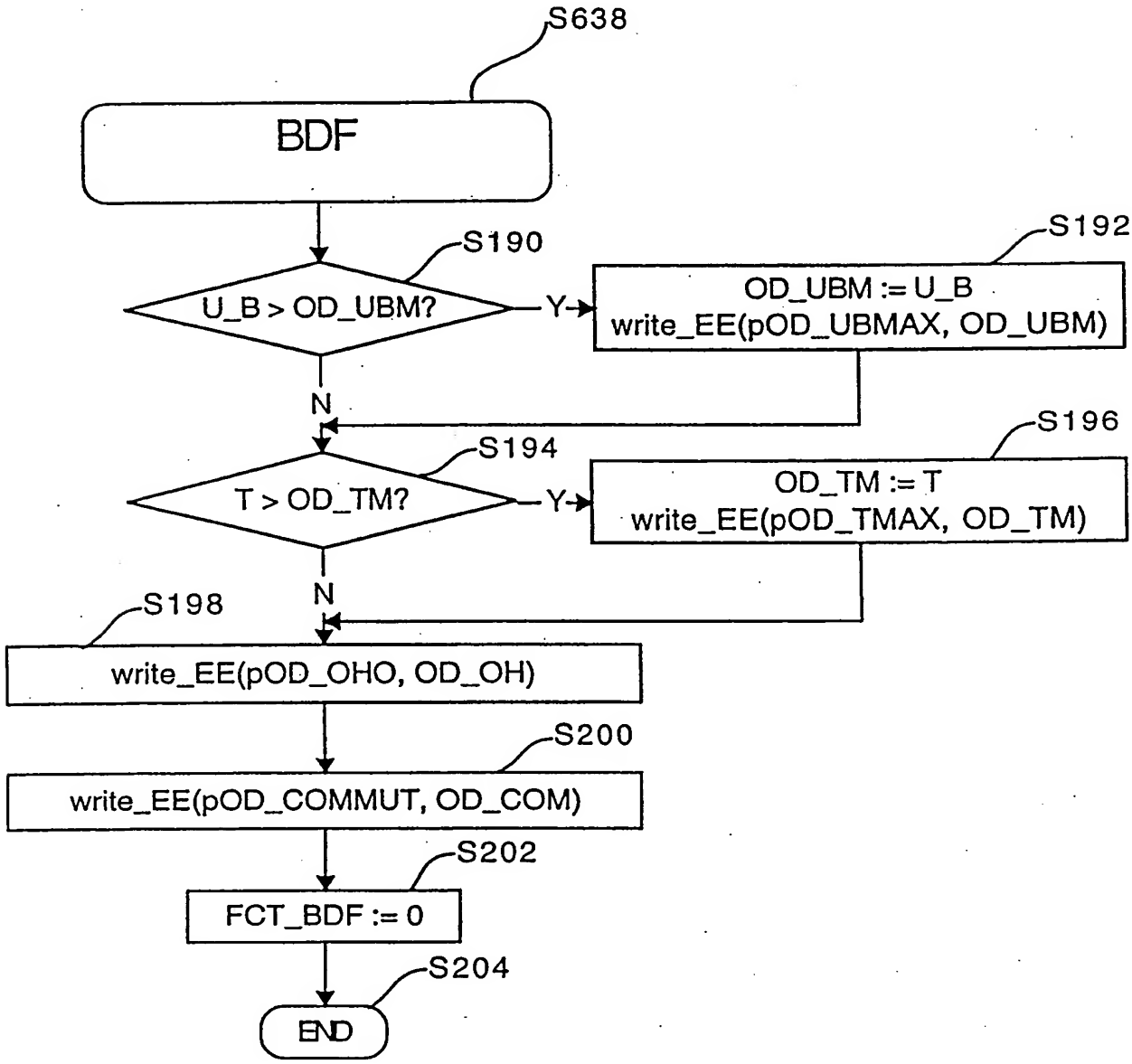
S638
BDF
S190
U_B > OD_UBM?
Y
S192
OD_UBM := U_B
write_EE(pOD_UBMAX, OD_UBM)
N
S194
T > OD_TM?
Y
S196
OD_TM := T
write_EE(pOD_TMAX, OD_TM)
N
S198
write_EE(pOD_OHO, OD_OH)
S200
write_EE(pOD_COMMUT, OD_COM)
S202
FCT_BDF := 0
S204
END

Fig. 15

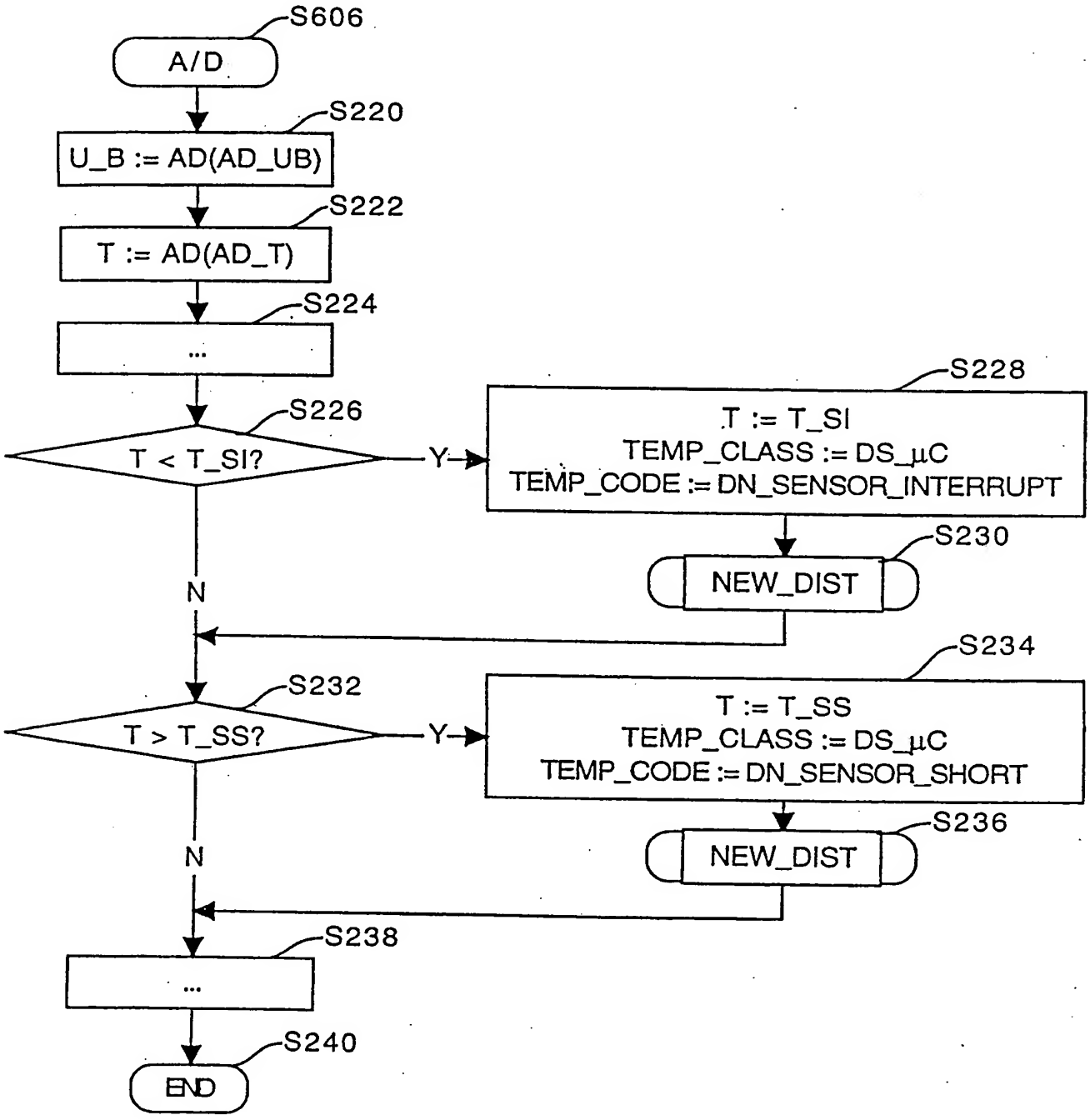
S606
A/D
S220
U_B := AD(AD_UB)
S222
T := AD(AD_T)
S224
...
S226
T < T_SI?
Y
S228
T := T_SI
TEMP_CLASS := DS_µC
TEMP_CODE := DN_SENSOR_INTERRUPT
S230
NEW_DIST
N
S232
T > T_SS?
Y
S234
T := T_SS
TEMP_CLASS := DS_µC
TEMP_CODE := DN_SENSOR_SHORT
S236
NEW_DIST
N
S238
...
S240
END

Fig. 16

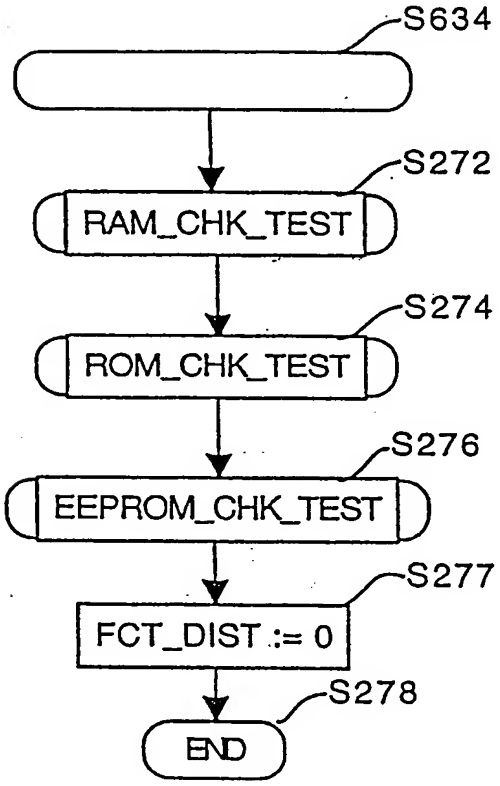
S634
S272
RAM_CHK_TEST
S274
ROM_CHK_TEST
S276
EEPROM_CHK_TEST
S277
FCT_DIST := 0
S278
END

Fig. 17

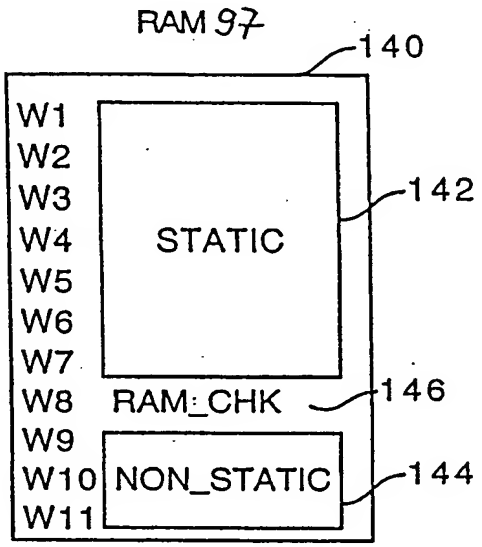
RAM 97
140
W1
W2
W3
W4
W5
W6
W7
STATIC
142
W8
RAM_CHK
146
W9
W10
W11
NON_STATIC
144

Fig. 18

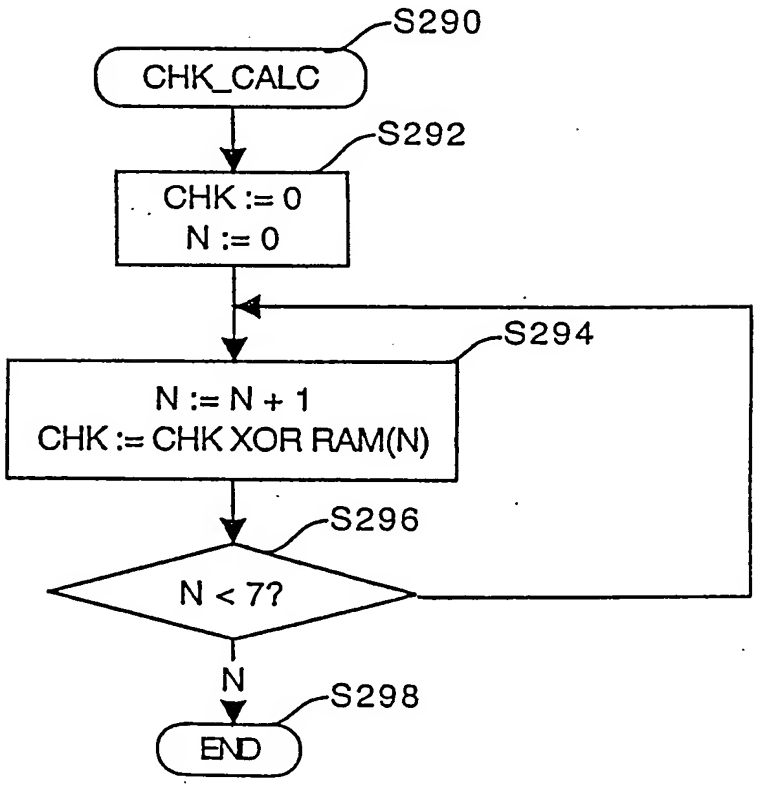
S290
CHK_CALC
S292
CHK := 0
N := 0
S294
N := N + 1
CHK := CHK XOR RAM(N)
S296
N < 7?
N
S298
END

Fig. 19

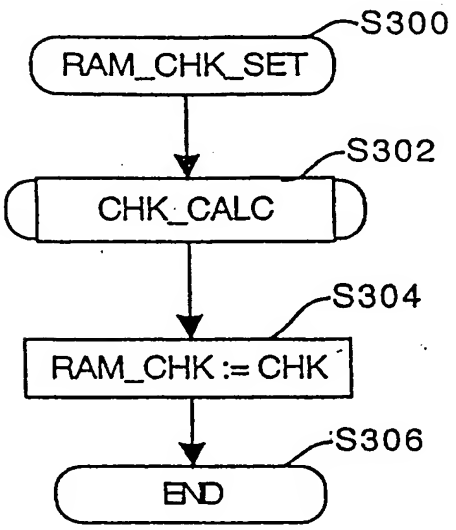
S300
RAM_CHK_SET
S302
CHK_CALC
S304
RAM_CHK := CHK
S306
END

Fig. 20

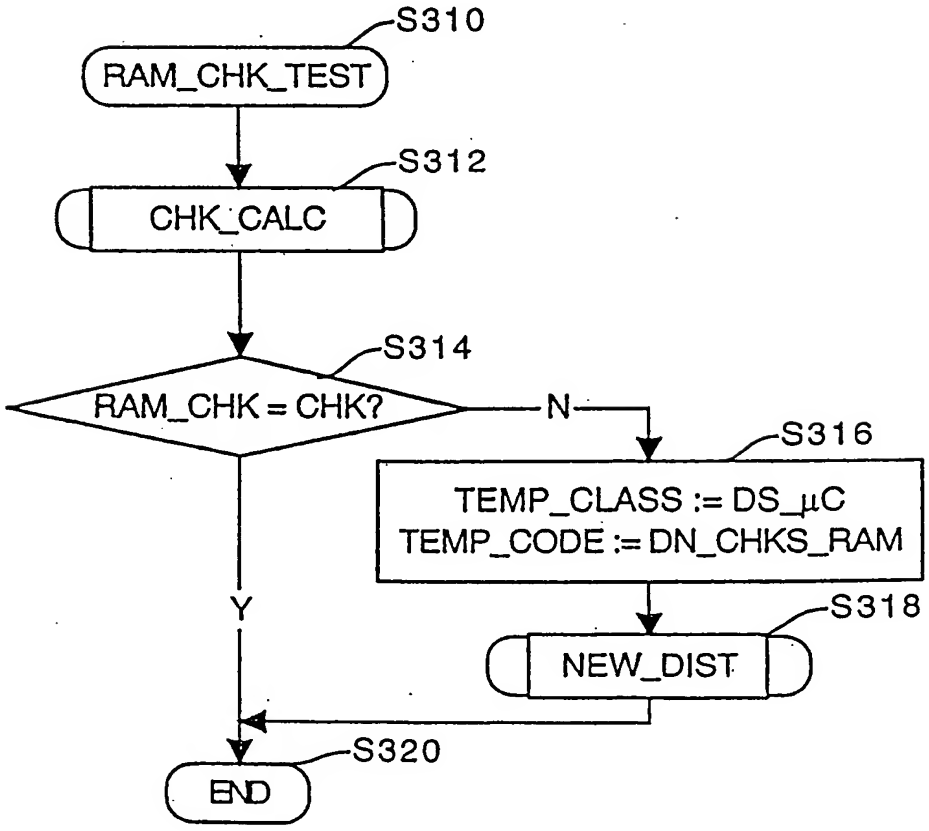
S310
RAM_CHK_TEST
S312
CHK_CALC
S314
RAM_CHK = CHK?
N
S316
TEMP_CLASS := DS_µC
TEMP_CODE := DN_CHKS_RAM
Y
S318
NEW_DIST
S320
END

Fig. 21

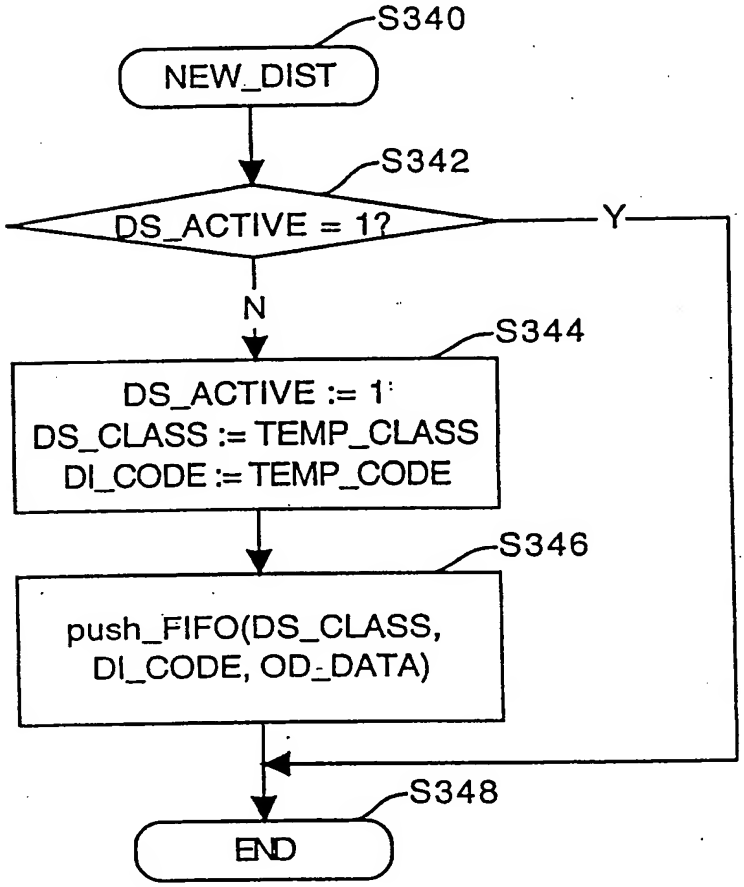
S340
NEW_DIST
S342
DS_ACTIVE = 1?
Y
N
S344
DS_ACTIVE := 1
DS_CLASS := TEMP_CLASS
DI_CODE := TEMP_CODE
S346
push_FIFO(DS_CLASS,
DI_CODE, OD_DATA)
S348
END

Fig. 22

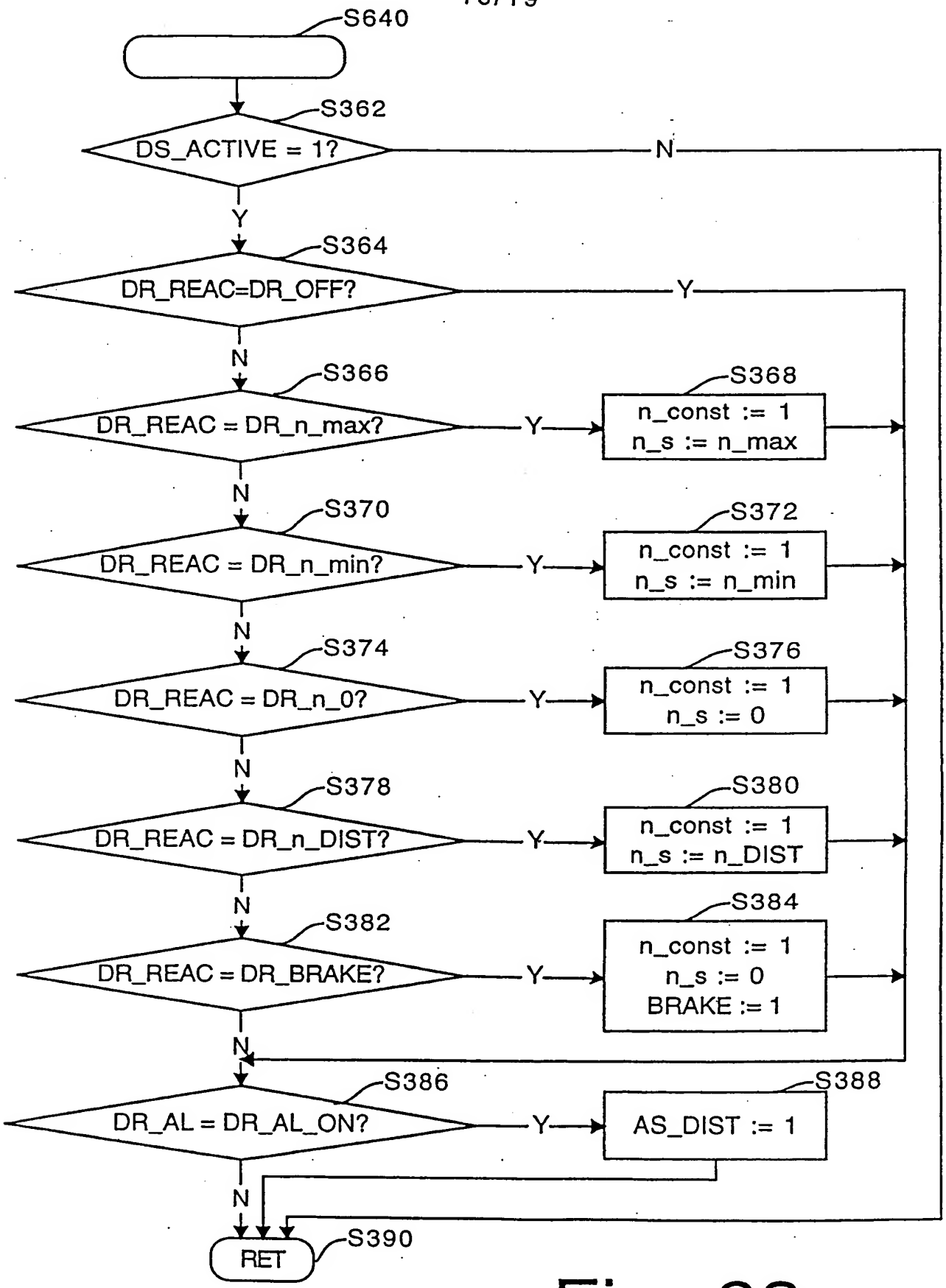
S640
S362
DS_ACTIVE = 1?
N
Y
S364
DR_REAC=DR_OFF?
Y
N
S366
DR_REAC = DR_n_max?
Y
S368
n_const := 1
n_s := n_max
N
S370
DR_REAC = DR_n_min?
Y
S372
n_const := 1
n_s := n_min
N
S374
DR_REAC = DR_n_0?
Y
S376
n_const := 1
n_s := 0
N
S378
DR_REAC = DR_n_DIST?
Y
S380
n_const := 1
n_s := n_DIST
N
S382
DR_REAC = DR_BRAKE?
Y
S384
n_const := 1
n_s := 0
BRAKE := 1
N
S386
DR_AL = DR_AL_ON?
Y
S388
AS_DIST := 1
N
RET
S390

Fig. 23

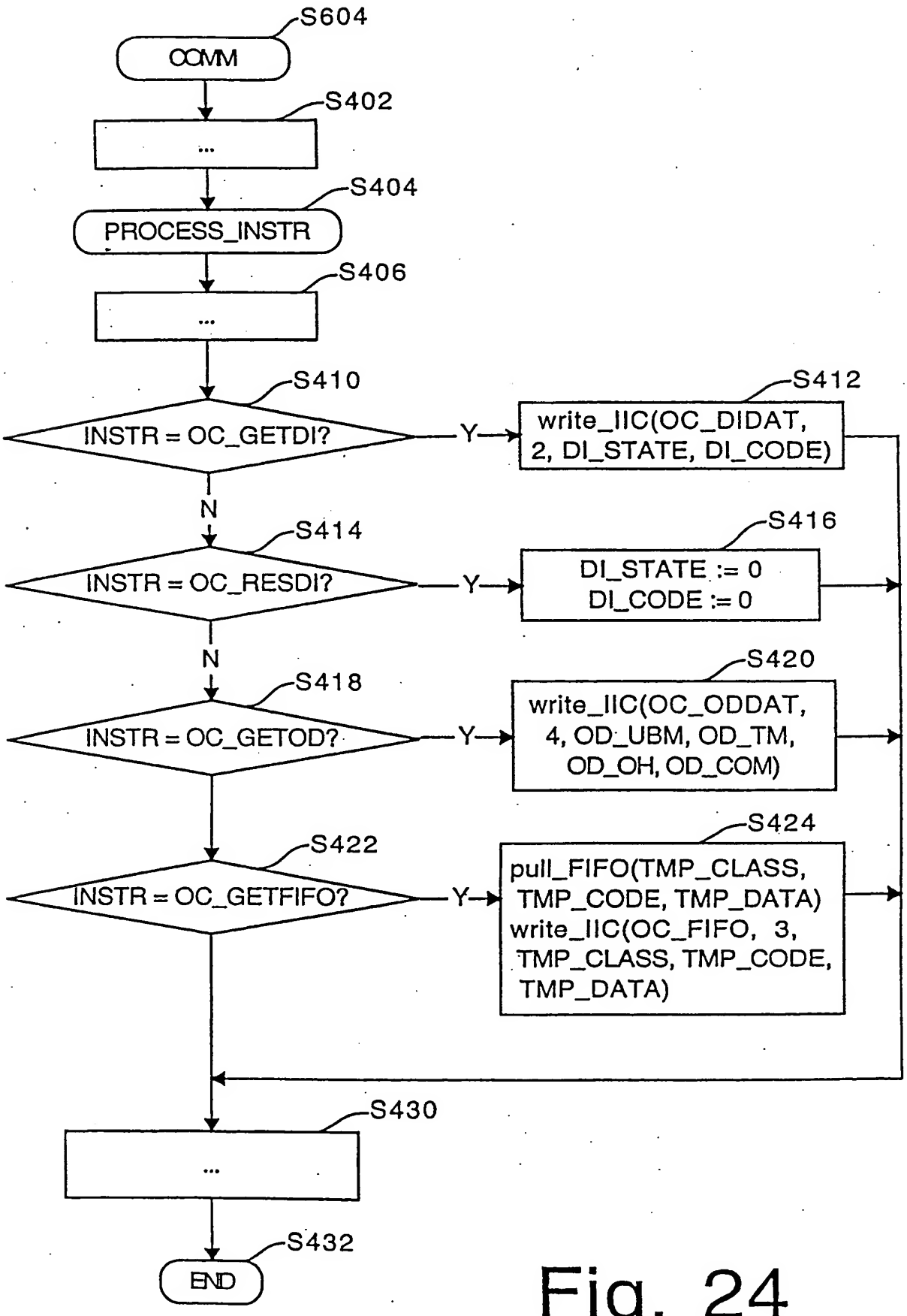
S604
COMM
S402
...
S404
PROCESS_INSTR
S406
...
S410
INSTR = OC_GETDI?
Y
S412
write_IIC(OC_DIDAT, 2, DI_STATE, DI_CODE)
N
S414
INSTR = OC_RESDI?
Y
S416
DI_STATE := 0
DI_CODE := 0
N
S418
INSTR = OC_GETOD?
Y
S420
write_IIC(OC_ODDAT, 4, OD_UBM, OD_TM, OD_OH, OD_COM)
S422
INSTR = OC_GETFIFO?
Y
S424
pull_FIFO(TMP_CLASS, TMP_CODE, TMP_DATA)
write_IIC(OC_FIFO, 3, TMP_CLASS, TMP_CODE, TMP_DATA)
S430
...
S432
END

Fig. 24